EX

SEOUENCE LISTING

1

```
<110> Luche, Ralf M.
      Wei, Bo
<120> DSP-16 DUAL-SPECIFICITY PHOSPHATASE
<130> 200125.434
<140> US
<141> 2001-09-25
<160> 22
<170> FastSEO for Windows Version 4.0
<210> 1
<211> 3496
<212> DNA
<213> Homo sapiens
<400> 1
gcgagcgga gcgcagccgc cetetegget ecgeggegge gcetegcaag teegggagge 120
gaggggggcc cgaggggaga cgccgtgaca actttcgttt ccctctgagg gaattgggag 180
gtcggcggcc ccaaaagctt tcagtccagt gtaaagctgt tggagcgcgg gagcaaaggt 240
aaaqaatqat qtaatqcqct qqctqctcca aaqcatcttt tgttgtggaa tggttattcc 300
agtcatctct ttatgaatca aatgtgaggg gctgctttgt ggacggagtc ctttgcaaga 360
qcacatcaac qqqaaaqaqa aaqaqacatt cacttggagg gctcttgctg aaaatgggtt 420
taacteteet tittgecagte accaecagee tgaceteata caetittagt acaatggagt 480
ggctgagcct ttgagcacac caccattaca tcatcgtggc aaattaaaga aggaggtggg 540
aaaagaggac ttattgttgt catggcccat gagatgattg gaactcaaat tgttactgag 600
aggttggtgg ctctgctgga aagtggaacg gaaaaagtgc tgctaattga tagccggcca 660
tttgtggaat acaatacatc ccacattttg gaagccatta atatcaactg ctccaagctt 720
atgaagcgaa ggttgcaaca ggacaaagtg ttaattacag agctcatcca gcattcagcg 780
aaacataagg ttgacattga ttgcagtcag aaggttgtag tttacgatca aagctcccaa 840
gatgttgcct ctctctttc agactgtttt ctcactgtac ttctgggtaa actggagaag 900
agetteaact etgtteacet gettgeaggt gggtttgetg agtteteteg ttgttteeet 960
ggcctctgtg aaggaaaatc cactctagtc cctacctgca tttctcagcc ttgcttacct 1020
gttgccaaca ttgggccaac ccgaattctt cccaatcttt atcttggctg ccagcgagat 1080
gtcctcaaca aggagctgat gcagcagaat gggattggtt atqtqttaaa tgccagcaat 1140
acctgtccaa agcctgactt tatccccgag tctcatttcc tgcgtgtgcc tgtgaatgac 1200
agcttttgtg agaaaatttt gccgtggttg gacaaatcag tagatttcat tgagaaagca 1260
aaagcctcca atggatgtgt tctagtgcac tgtttagctg ggatctcccg ctccgccacc 1320
ategetateg cetacateat gaagaggatg gacatgtett tagatgaage ttacagattt 1380
gtgaaagaaa aaagacctac tatatctcca aacttcaatt ttctgggcca actcctggac 1440
tatgagaaga agattaagaa ccagactgga gcatcagggc caaagagcaa actcaagctg 1500
ctgcacctgg agaagccaaa tgaacctgtc cctgctgtct cagagggtgg acagaaaagc 1560
gagacqcccc tcagtccacc ctgtqccgac tctqctacct cagaggcagc aggacaaagg 1620
cccgtgcatc ccgccagcgt gcccagcgtg cccagcgtgc agccgtcgct gttagaggac 1680
agcccgctgg tacaggcgct cagtgggctg cacctgtccg cagacaggct ggaagacagc 1740
```

aataagctca agcgttcctt ctctctggat atcaaatcag tttcatattc agccagcatg 1800

<211> 665

<212> PRT

130

```
gcagcatcct tacatggctt ctcctcatca gaagatgctt tggaatacta caaaccttcc 1860
actactctgg atgggaccaa caagctatgc cagttctccc ctgttcagga actatcggag 1920
cagacteceg aaaccagtee tgataaggag gaagceagea teeccaagaa getgeagaee 1980
gccaggcctt cagacagcca gagcaagcga ttgcattcgg tcagaaccag cagcagtggc 2040
accgcccaga ggtccctttt atctccactg catcgaagtg ggagcgtgga ggacaattac 2100
cacaccagct teettttegg cetttecace agecageage aceteaegaa gtetgetgge 2160
ctgggcctta agggctggca ctcggatatc ttggcccccc agacctctac cccttccctg 2220
accagcaget ggtattttgc cacagagtec teacacttet actetgeete agecatetae 2280
ggaggcagtg ccagttactc tgcctacagc tgcagccagc tgcccacttg cggagaccaa 2340
gtctattctg tgcgcaggcg gcagaagcca agtgacagag ctgactcgcg gcggagctgg 2400
catgaagaga gcccctttga aaagcagttt aaacgcagaa gctgccaaat ggaatttgga 2460
gagagcatca tgtcagagaa caggtcacgg gaagagctgg ggaaagtggg cagtcagtct 2520
agettttegg geageatgga aateattgag gteteetgag aagaaagaea ettgtgaett 2580
ctatagacaa ttttttttt ttgttcacaa aaaaattccc tgtaaatctg aaatatatat 2640
atgtacatac atatatattt ttggaaaatg gagctatggt gtaaaagcaa caggtggatc 2700
aacccagttg ttactctctt aacatctgca tttgagagat cagctaatac ttctctcaac 2760
aaaaatggaa gggcagatgc tagaatcccc cctagacgga ggaaaaccat tttattcagt 2820
gaattacaca tootottgtt ottaaaaaaag caagtgtott tggtgttgga ggacaaaato 2880
ccctaccatt ttccacgttg tgctactaag agatctcaaa tattagtctt tgtccggacc 2940
cttccatagt acacettage getgagactg agecagettg ggggtcaggt aggtagacee 3000
tgttagggac agagcctagt ggtaaatcca agagaaatga tcctatccaa agctgattca 3060
caaacccacg ctcacctgac agccgaggga cacgagcatc actctgctgg acggaccatt 3120
aggggccttg ccaaggtcta ccttagagca aacccagtac ctcagacagg aaagtcgggg 3180
ctttgaccac taccatatct ggtagcccat tttctaggca ttgtgaatag gtaggtagct 3240
agtcacactt ttcagaccaa ttcaaactgt ctatgcacaa aattcccgtg ggcctagatg 3300
gagataattt ttttttcttc tcagctttat gaagagaagg gaaactgtct aggattcagc 3360
tgaaccacca ggaacctggc aacatcacga tttaagctaa ggttgggagg ctaacgagtc 3420
tacctccctc tttgtaaatc aaagaattgt ttaaaatggg attgtcaatc ctttaaataa 3480
agatgaactt ggtttc
                                                                  3496
<210> 2
```

```
<213> Homo sapiens
<400> 2
Met Ala His Glu Met Ile Gly Thr Gln Ile Val Thr Glu Arg Leu Val
                                    10
Ala Leu Leu Glu Ser Gly Thr Glu Lys Val Leu Leu Ile Asp Ser Arg
                                25
Pro Phe Val Glu Tyr Asn Thr Ser His Ile Leu Glu Ala Ile Asn Ile
                            40
Asn Cys Ser Lys Leu Met Lys Arg Arg Leu Gln Gln Asp Lys Val Leu
                        55
Ile Thr Glu Leu Ile Gln His Ser Ala Lys His Lys Val Asp Ile Asp
                                        75
Cys Ser Gln Lys Val Val Tyr Asp Gln Ser Ser Gln Asp Val Ala
                85
                                    90
Ser Leu Ser Ser Asp Cys Phe Leu Thr Val Leu Leu Gly Lys Leu Glu
                                105
                                                    110
Lys Ser Phe Asn Ser Val His Leu Leu Ala Gly Gly Phe Ala Glu Phe
                            120
Ser Arg Cys Phe Pro Gly Leu Cys Glu Gly Lys Ser Thr Leu Val Pro
```

140

135

:

Thr Cys Ile Ser Gln Pro Cys Leu Pro Val Ala Asn Ile Gly Pro Thr Arg Ile Leu Pro Asn Leu Tyr Leu Gly Cys Gln Arg Asp Val Leu Asn Lys Glu Leu Met Gln Gln Asn Gly Ile Gly Tyr Val Leu Asn Ala Ser Asn Thr Cys Pro Lys Pro Asp Phe Ile Pro Glu Ser His Phe Leu Arg Val Pro Val Asn Asp Ser Phe Cys Glu Lys Ile Leu Pro Trp Leu Asp Lys Ser Val Asp Phe Ile Glu Lys Ala Lys Ala Ser Asn Gly Cys Val Leu Val His Cys Leu Ala Gly Ile Ser Arg Ser Ala Thr Ile Ala Ile Ala Tyr Ile Met Lys Arg Met Asp Met Ser Leu Asp Glu Ala Tyr Arg Phe Val Lys Glu Lys Arg Pro Thr Ile Ser Pro Asn Phe Asn Phe Leu Gly Gln Leu Leu Asp Tyr Glu Lys Lys Ile Lys Asn Gln Thr Gly Ala Ser Gly Pro Lys Ser Lys Leu Lys Leu His Leu Glu Lys Pro Asn Glu Pro Val Pro Ala Val Ser Glu Gly Gly Gln Lys Ser Glu Thr Pro Leu Ser Pro Pro Cys Ala Asp Ser Ala Thr Ser Glu Ala Ala Gly Gln Arg Pro Val His Pro Ala Ser Val Pro Ser Val Pro Ser Val Gln Pro Ser Leu Leu Glu Asp Ser Pro Leu Val Gln Ala Leu Ser Gly Leu His Leu Ser Ala Asp Arg Leu Glu Asp Ser Asn Lys Leu Lys Arg Ser Phe Ser Leu Asp Ile Lys Ser Val Ser Tyr Ser Ala Ser Met Ala Ala Ser Leu His Gly Phe Ser Ser Glu Asp Ala Leu Glu Tyr Tyr Lys Pro Ser Thr Thr Leu Asp Gly Thr Asn Lys Leu Cys Gln Phe Ser Pro Val Gln Glu Leu Ser Glu Gln Thr Pro Glu Thr Ser Pro Asp Lys Glu Glu Ala Ser Ile Pro Lys Lys Leu Gln Thr Ala Arg Pro Ser Asp Ser Gln Ser Lys Arg Leu His Ser Val Arg Thr Ser Ser Ser Gly Thr Ala Gln Arg Ser Leu Leu Ser Pro Leu His Arg Ser Gly Ser Val Glu Asp Asn Tyr His Thr Ser Phe Leu Phe Gly Leu Ser Thr Ser Gln Gln His Leu Thr Lys Ser Ala Gly Leu Gly Leu Lys Gly Trp His Ser Asp Ile Leu Ala Pro Gln Thr Ser Thr Pro Ser Leu Thr Ser Ser Trp Tyr Phe Ala Thr Glu Ser Ser His Phe Tyr Ser Ala Ser Ala Ile Tyr Gly Gly Ser

```
Ala Ser Tyr Ser Ala Tyr Ser Cys Ser Gln Leu Pro Thr Cys Gly Asp
                               585
Gln Val Tyr Ser Val Arg Arg Gln Lys Pro Ser Asp Arg Ala Asp
       595
                           600
                                              605
Ser Arg Arg Ser Trp His Glu Glu Ser Pro Phe Glu Lys Gln Phe Lys
                      615
                                           620
Arg Arg Ser Cys Gln Met Glu Phe Gly Glu Ser Ile Met Ser Glu Asn
                   630
                                      635
Arg Ser Arg Glu Glu Leu Gly Lys Val Gly Ser Gln Ser Ser Phe Ser
               645
                                   650
Gly Ser Met Glu Ile Ile Glu Val Ser
```

<210> 3 <211> 156 <212> PRT <213> Homo sapiens

<400> 3

Asp Gly Ser Pro Leu Ser Asn Ser Gln Pro Ser Phe Pro Val Glu Ile Leu Pro Phe Leu Tyr Leu Gly Cys Ala Lys Asp Ser Thr Asn Leu Asp Val Leu Glu Glu Phe Gly Ile Lys Tyr Ile Leu Asn Val Thr Pro Asn 40 Leu Pro Asn Leu Phe Glu Asn Ala Gly Glu Phe Lys Tyr Lys Gln Ile 55 Pro Ile Ser Asp His Trp Ser Gln Asn Leu Ser Gln Phe Pro Glu 70 75 Ala Ile Ser Phe Ile Asp Glu Ala Arg Gly Lys Asn Cys Gly Val Leu 90 Val His Cys Leu Ala Gly Ile Ser Arg Ser Val Thr Val Thr Val Ala 100 105 Tyr Leu Met Gln Lys Leu Asn Leu Ser Met Asn Asp Ala Tyr Asp Ile 120 Val Lys Met Lys Lys Ser Asn Ile Ser Pro Asn Phe Asn Phe Met Gly 135 Gln Leu Leu Asp Phe Glu Arg Thr Leu Gly Leu Ser 150

<210> .4 <211> 156 <212> PRT <213> Homo sapiens

 <210> 5 <211> 156

```
      Leu
      Pro
      Asn
      Ala
      Phe
      Glu
      His
      Gly
      Gly
      Glu
      Phe
      Thr
      Tyr
      Lys
      Gln
      Ile

      Pro
      Ile
      Ser
      Asp
      His
      Trp
      Ser
      Gln
      Asn
      Leu
      Ser
      Gln
      Phe
      Phe
      Phe
      Pro
      Glu
      Asp
      A
```

<212> PRT <213> Homo sapiens <400> 5 Ala Thr Pro Pro Pro Val Gly Leu Arg Ala Ser Phe Pro Val Gln Ile Leu Pro Asn Leu Tyr Leu Gly Ser Ala Arg Asp Ser Ala Asn Leu Glu Ser Leu Ala Lys Leu Gly Ile Arq Tyr Ile Leu Asn Val Thr Pro Asn Leu Pro Asn Phe Phe Glu Lys Asn Gly Asp Phe His Tyr Lys Gln Ile 、 55 Pro Ile Ser Asp His Trp Ser Gln Asn Leu Ser Arg Phe Phe Pro Glu 70 75 Ala Ile Glu Phe Ile Asp Glu Ala Leu Ser Gln Asn Cys Gly Val Leu 8.5 90 Val His Cys Leu Ala Gly Val Ser Arg Ser Val Thr Val Thr Val Ala 105 Tyr Leu Met Gln Lys Leu His Leu Ser Leu Asn Asp Ala Tyr Asp Leu

115 120 125 Val Lys Arg Lys Lys Ser Asn Ile Ser Pro Asn Phe Asn Phe Met Gly

130 135 140 Gln Leu Leu Asp Phe Glu Arg Ser Leu Arg Leu Glu

<210> 6 <211> 155 <212> PRT <213> Homo sapiens

```
Leu Met Thr Gln Asn Gly Ile Ser Tyr Val Leu Asn Ala Ser Asn Ser
Cys Pro Lys Pro Asp Phe Ile Cys Glu Ser Arg Phe Met Arg Val Pro
Ile Asn Asp Asn Tyr Cys Glu Lys Leu Leu Pro Trp Leu Asp Lys Ser
                    70
                                        75
Ile Glu Phe Ile Asp Lys Ala Lys Leu Ser Ser Cys Gln Val Ile Val
His Cys Leu Ala Gly Ile Ser Arg Ser Ala Thr Ile Ala Ile Ala Tyr
                                105
Ile Met Lys Thr Met Gly Met Ser Ser Asp Asp Ala Tyr Arg Phe Val
        115
                            120
Lys Asp Arg Arg Pro Ser Ile Ser Pro Asn Phe Asn Phe Leu Gly Gln
                       135
Leu Leu Glu Tyr Glu Arg Thr Leu Lys Leu Leu
                    150
<210> 7
<211> 155
<212> PRT
<213> Homo sapiens
<400> 7
Ile Ser Gln Pro Cys Leu Pro Val Ala Asn Ile Gly Pro Thr Arg Ile
Leu Pro Asn Leu Tyr Leu Gly Cys Gln Arg Asp Val Leu Asn Lys Glu
                                25
Leu Met Gln Gln Asn Gly Ile Gly Tyr Val Leu Asn Ala Ser Asn Thr
                            40
Cys Pro Lys Pro Asp Phe Ile Pro Glu Ser His Phe Leu Arg Val Pro
Val Asn Asp Ser Phe Cys Glu Lys Ile Leu Pro Trp Leu Asp Lys Ser
                    70
                                        75
Val Asp Phe Ile Glu Lys Ala Lys Ala Ser Asn Gly Cys Val Leu Val
His Cys Leu Ala Gly Ile Ser Arg Ser Ala Thr Ile Ala Ile Ala Tyr
                                105
Ile Met Lys Arg Met Asp Met Ser Leu Asp Glu Ala Tyr Arg Phe Val
        115
                            120
Lys Glu Lys Arg Pro Thr Ile Ser Pro Asn Phe Asn Phe Leu Gly Gln
                       135
Leu Leu Asp Tyr Glu Lys Lys Ile Lys Asn Gln
145
                    150
<210> 8
<211> 154
<212> PRT
<213> Homo sapiens
```

Ser Asp Pro Arg Val Pro Ile Tyr Asp Gln Gly Gly Pro Val Glu Ile

```
Leu Pro Tyr Leu Tyr Leu Gly Ser Cys Asn His Ser Ser Asp Leu Gln
Gly Leu Gln Ala Cys Gly Ile Thr Ala Val Leu Asn Val Ser Ala Ser
                            40
Cys Pro Asn His Phe Glu Gly Leu Phe His Tyr Lys Ser Ile Pro Val
                        55
Glu Asp Asn Gln Met Val Glu Ile Ser Ala Trp Phe Gln Glu Ala Ile
Ser Phe Ile Asp Ser Val Lys Asn Ser Gly Gly Arg Val Leu Val His
Cys Gln Ala Gly Ile Ser Arg Ser Ala Thr Ile Cys Leu Ala Tyr Leu
                                105
            100
Ile Gln Ser His Arg Val Arg Leu Asp Glu Ala Phe Asp Phe Val Lys
                           120
Gln Arg Arg Gly Val Ile Ser Pro Asn Phe Ser Phe Met Gly Gln Leu
                        135
Leu Gln Leu Glu Thr Gln Val Leu Cys His
                    150
```

<210> 9 <211> 154 <212> PRT <213> Homo sapiens

<400> 9

Ser Ser Cys Ser Thr Pro Leu Tyr Asp Gln Gly Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr Leu Gly Ser Ala Tyr His Ala Ser Arg Lys Asp 25 Met Leu Asp Ala Leu Gly Ile Thr Ala Leu Ile Asn Val Ser Ala Asn 40 Cys Pro Asn His Phe Glu Gly His Tyr Gln Tyr Lys Ser Ile Pro Val 55 Glu Asp Asn His Lys Ala Asp Ile Ser Ser Trp Phe Asn Glu Ala Ile Asp Phe Ile Asp Ser Ile Lys Asn Ala Gly Gly Arg Val Phe Val His Cys Gln Ala Gly Ile Ser Arg Ser Ala Thr Ile Cys Leu Ala Tyr Leu 100 105 Met Arg Thr Asn Arg Val Lys Leu Asp Glu Ala Phe Glu Phe Val Lys 120 Gln Arg Arg Ser Ile Ile Ser Pro Asn Phe Ser Phe Met Gly Gln Leu 135 Leu Gln Phe Glu Ser Gln Val Leu Ala Pro 150

<210> 10 <211> 154

<212> PRT

<213> Homo sapiens

<400> 10

```
Ser Ser Cys Gly Thr Pro Leu His Asp Gln Gly Pro Val Glu Ile
                                    10
Leu Pro Phe Leu Tyr Leu Gly Ser Ala Tyr His Ala Ala Arg Arg Asp
                                25
Met Leu Asp Ala Leu Gly Ile Thr Ala Leu Leu Asn Val Ser Ser Asp
                            40
Cys Pro Asn His Phe Glu Gly His Tyr Gln Tyr Lys Cys Ile Pro Val
                        55
Glu Asp Asn His Lys Ala Asp Ile Ser Ser Trp Phe Met Glu Ala Ile
                    70
Glu Tyr Ile Asp Ala Val Lys Asp Cys Arg Gly Arg Val Leu Val His
                                    90
Cys Gln Ala Gly Ile Ser Arg Ser Ala Thr Ile Cys Leu Ala Tyr Leu
                                105
Met Met Lys Lys Arg Val Arg Leu Glu Glu Ala Phe Glu Phe Val Lys
                           120
Gln Arg Arg Ser Ile Ile Ser Pro Asn Phe Ser Phe Met Gly Gln Leu
                        135
Leu Gln Phe Glu Ser Gln Val Leu Ala Thr
                    150
<210> 11
<211> 154
<212> PRT
<213> Homo sapiens
<400> 11
Asn Val Ser Tyr Arg Pro Ala Tyr Asp Gln Gly Gly Pro Val Glu Ile
                                    10
Leu Pro Phe Leu Tyr Leu Gly Ser Ala Tyr His Ala Ser Lys Cys Glu
            20
                                25
Phe Leu Ala Asn Leu His Ile Thr Ala Leu Leu Asn Val Ser Arg Arg
                            40
Thr Ser Glu Ala Cys Met Thr His Leu His Tyr Lys Trp Ile Pro Val
Glu Asp Ser His Thr Ala Asp Ile Ser Ser His Phe Gln Glu Ala Ile
                    70
Asp Phe Ile Asp Cys Val Arg Glu Lys Gly Gly Lys Val Leu Val His
               85
                                    90
Cys Glu Ala Gly Ile Ser Arg Ser Pro Thr Ile Cys Met Ala Tyr Leu
                               105
Met Lys Thr Lys Gln Phe Arg Leu Lys Glu Ala Phe Asp Tyr Ile Lys
                            120
Gln Arg Arg Ser Met Val Ser Pro Asn Phe Gly Phe Met Gly Gln Leu
                       135
Leu Gln Tyr Glu Ser Glu Ile Leu Pro Ser
                    150
```

<210> 12

<211> 163

<212> PRT

<213> Homo sapiens

<212> DNA

```
<400> 12
Asp Gly Ser Gly Cys Tyr Ser Leu Pro Ser Gln Pro Cys Asn Glu Val
Thr Pro Arg Ile Tyr Val Gly Asn Ala Ser Val Ala Gln Asp Ile Pro
            20
                                25
Lys Leu Gln Lys Leu Gly Ile Thr His Val Leu Asn Ala Ala Glu Gly
                            40
Arg Ser Phe Met His Val Asn Thr Asn Ala Asn Phe Tyr Lys Asp Ser
Gly Ile Thr Tyr Leu Gly Ile Lys Ala Asn Asp Thr Gln Glu Phe Asn
65
                                        75
                    70
Leu Ser Ala Tyr Phe Glu Arg Ala Ala Asp Phe Ile Asp Gln Ala Leu
                                    90
Ala Gln Lys Asn Gly Arg Val Leu Val His Cys Arg Glu Gly Tyr Ser
            100
                                105
Arg Ser Pro Thr Leu Val Ile Ala Tyr Leu Met Met Arg Gln Lys Met
       115
                            120
Asp Val Lys Ser Ala Leu Ser Tyr Val Arg Gln Asn Arg Glu Ile Gly
                        135
                                            140
Pro Asn Asp Gly Phe Leu Ala Gln Leu Cys Gln Leu Asn Asp Arg Leu
                    150
Ala Lys Glu
<210> 13
<211> 41
<212> PRT
<213> Homo sapiens
<400> 13
Lys Ala Lys Ala Ser Asn Gly Cys Val Leu Val His Cys Leu Ala Gly
                5
                                    10
Ile Ser Arg Ser Ala Thr Ile Ala Ile Ala Tyr Ile Met Lys Arg Met
Asp Met Ser Leu Asp Glu Ala Tyr Arg
<210> 14
<211> 38
<212> DNA
<213> Artificial Sequence
<220>
<223> PCR primer
<400> 14
caaagtgtta attacagagc tcatccagca ttcagcga
<210> 15
<211> 30
```

38

```
<213> Artificial Sequence
<220>
<223> PCR primer
<400> 15
                                                                    30
ttggcttctc caggtgcagc agcttgagtt
<210> 16
<211> 10
<212> PRT
<213> Homo sapiens
<400> 16
Val His Cys Leu Ala Gly Ile Ser Arg Ser
                 5
<210> 17
<211> 24
<212> PRT
<213> Artificial Sequence
<223> Conserved homology sequence of eight human DSP
      amino acid sequences.
Asn Gly Arg Val Leu Val His Cys Gln Ala Gly Ile Ser Arg Ser Gly
                                     10
Thr Asn Ile Leu Ala Tyr Leu Met
            20
<210> 18
<211> 32
<212> DNA
<213> Artificial Sequence
<220>
<223> RACE primer
<400> 18
                                                                    32
catttcctgc gtgtgcctgt gaatgacagc tt
<210> 19
<211> 35
<212> DNA
<213> Artificial Sequence
<220>
<223> RACE primer
<400> 19
```

aagagagaga ggcaacatct tgggagcttt gatcg

<210> 20 <211> 3332 <212> DNA

<213> Homo sapiens

35

```
<400> 20
gcgagcggga gcgcagccgc cctctcggct ccgcggcggc gcctcgcaag tccgggaggc 120
gaggggggcc cgaggggaga cgccgtgaca actttcgttt ccctctgagg gaattgggag 180
gtcggcggcc ccaaaagctt tcagtccagt gtaaagctgt tggagcgcgg gagcaaaggt 240
aaagaatgat gtaatgcgct ggctgctcca aagcatcttt tgttgtggaa tggttattcc 300
agtcatctct ttatgaatca aatgtgaggg gctgctttgt ggacggagtc ctttgcaaga 360
gcacatcaac gggaaagaga aagagacatt cacttggagg gctcttgctg aaaatgggtt 420
taactctcct tttgccagtc accaccagcc tgacctcata cacttttagt acaatggagt 480
ggctgagcct ttgagcacac caccattaca tcatcgtggc aaattaaaga aggaggtggg 540
aaaagaggac ttattgttgt catggcccat gagatgattg gaactcaaat tgttactgag 600
aggttggtgg ctctgctgga aagtggaacg gaaaaagtgc tgctaattga tagccggcca 660
tttgtggaat acaatacatc ccacattttg gaagccatta atatcaactg ctccaagctt 720
atgaagcgaa ggttgcaaca ggacaaagtg ttaattacag agctcatcca gcattcagcg 780
aaacataagg ttgacattga ttgcagtcag aaggttgtag tttacgatca aagctcccaa 840
gatgttgcct ctctcttc agactgtttt ctcactgtac ttctgggtaa actggagaag 900
agetteaact etgtteaect gettgeagga getgatgeag eagaatggga ttggttatgt 960
gttaaatgcc agcaatacct gtccaaagcc tgactttatc cccgagtctc atttcctgcg 1020
tgtgcctgtg aatgacagct tttgtgagaa aattttgccg tggttggaca aatcagtaga 1080
tttcattgag aaagcaaaag cctccaatgg atgtgttcta gtgcactgtt tagctgggat 1140
ctcccgctcc gccaccatcg ctatcgccta catcatgaag aggatggaca tgtctttaga 1200
tgaagcttac agatttgtga aagaaaaaag acctactata tctccaaact tcaattttct 1260
gggccaactc ctggactatg agaagaagat taagaaccag actggagcat cagggccaaa 1320
gagcaaactc aagctgctgc acctggagaa gccaaatgaa cctgtccctg ctgtctcaga 1380
gggtggacag aaaagcgaga cgcccctcag tccaccctgt gccgactctg ctacctcaga 1440
ggcagcagga caaaggcccg tgcatcccgc cagcgtgccc agcgtgccca gcgtgcagcc 1500
\tt gtcgctgtta\ gaggacagcc\ cgctggtaca\ ggcgctcagt\ gggctgcacc\ tgtccgcaga\ 1560
caggctggaa gacagcaata agctcaagcg ttccttctct ctggatatca aatcagtttc 1620
atattcagcc agcatggcag catccttaca tggcttctcc tcatcagaag atgctttgga 1680
atactacaaa ccttccacta ctctggatgg gaccaacaag ctatgccagt tctcccctgt 1740
tcaggaacta tcggagcaga ctcccgaaac cagtcctgat aaggaggaag ccagcatccc 1800
caagaagetg cagacegeca ggeetteaga cageeagage aagegattge atteggteag 1860
aaccagcagc agtggcaccg cccagaggtc ccttttatct ccactgcatc gaagtgggag 1920
cqtqqaqqac aattaccaca ccaqcttcct tttcqqcctt tccaccaqcc aqcaqcacct 1980
cacgaagtct gctggcctgg gccttaaggg ctggcactcg gatatcttgg ccccccagac 2040
ctctacccct tccctgacca gcagctggta ttttgccaca gagtcctcac acttctactc 2100
tgcctcagcc atctacggag gcagtgccag ttactctgcc tacagctgca gccagctgcc 2160
cacttgcgga gaccaagtct attetgtgcg caggcggcag aagccaagtg acagagctga 2220
ctcgcggcgg agctggcatg aagagagccc ctttgaaaag cagtttaaac gcagaagctg 2280
ccaaatggaa tttggagaga gcatcatgtc agagaacagg tcacgggaag agctggggaa 2340
agtgggcagt cagtctagct tttcgggcag catggaaatc attgaggtct cctgagaaga 2400
aagacacttg tgacttctat agacaatttt tttttcttgt tcacaaaaaa attccctgta 2460
aatctgaaat atatatatgt acatacatat atatttttgg aaaatggagc tatggtgtaa 2520
```

aagcaacagg tggatcaacc cagttgttac tctcttaaca tctgcatttg agagatcagc 2580 taatacttct ctcaacaaaa atggaagggc agatgctaga atccccccta gacggaggaa 2640 aaccatttta ttcagtgaat tacacatcct cttgttctta aaaaagcaag tgtctttggt 2700 gttggaggac aaaatcccct accattttcc acgttgtgct actaagagat ctcaaatatt 2760

3332

```
agtetttgte eggaceette catagtacae ettagegetg agactgagee agettggggg 2820
tcaggtaggt agaccctgtt agggacagag cctagtggta aatccaagag aaatgatcct 2880
atccaaaget gattcacaaa eccaegetea eetgacagee gagggacaeg agcatcaete 2940
tgctggacgg accattaggg gccttgccaa ggtctacctt agagcaaacc cagtacctca 3000
gacaggaaag toggggottt gaccactaco atatotggta goccatttto taggoattgt 3060
gaataggtag gtagctagtc acacttttca gaccaattca aactgtctat gcacaaaatt 3120
cccgtgggcc tagatggaga taattttttt ttcttctcag ctttatgaag agaagggaaa 3180
ctgtctagga ttcagctgaa ccaccaggaa cctggcaaca tcacgattta agctaaggtt 3240
gggaggctaa cgagtctacc tccctcttg taaatcaaag aattgtttaa aatgggattg 3300
tcaatccttt aaataaagat gaacttggtt tc
<210> 21
<211> 517
<212> PRT
<213> Homo sapiens
<400> 21
Met Leu Pro Leu Ser Leu Gln Thr Val Phe Ser Leu Tyr Phe Trp Val
                                    10
Asn Trp Arg Arg Ala Ser Thr Leu Phe Thr Cys Leu Gln Glu Leu Met
                                25
Gln Gln Asn Gly Ile Gly Tyr Val Leu Asn Ala Ser Asn Thr Cys Pro
                            40
Lys Pro Asp Phe Ile Pro Glu Ser His Phe Leu Arg Val Pro Val Asn
                        55
Asp Ser Phe Cys Glu Lys Ile Leu Pro Trp Leu Asp Lys Ser Val Asp
                                        75
                    70
Phe Ile Glu Lys Ala Lys Ala Ser Asn Gly Cys Val Leu Val His Cys
                                    90
Leu Ala Gly Ile Ser Arg Ser Ala Thr Ile Ala Ile Ala Tyr Ile Met
            100
                                105
Lys Arg Met Asp Met Ser Leu Asp Glu Ala Tyr Arg Phe Val Lys Glu
       115
                            120
                                                 125
Lys Arg Pro Thr Ile Ser Pro Asn Phe Asn Phe Leu Gly Gln Leu Leu
                        135
Asp Tyr Glu Lys Lys Ile Lys Asn Gln Thr Gly Ala Ser Gly Pro Lys
                                        155
                    150
Ser Lys Leu Lys Leu Leu His Leu Glu Lys Pro Asn Glu Pro Val Pro
                                    170
Ala Val Ser Glu Gly Gly Gln Lys Ser Glu Thr Pro Leu Ser Pro Pro
            180
                                185
                                                     190
Cys Ala Asp Ser Ala Thr Ser Glu Ala Ala Gly Gln Arg Pro Val His
        195
                            200
                                                205
Pro Ala Ser Val Pro Ser Val Pro Ser Val Gln Pro Ser Leu Leu Glu
                        215
                                            220
Asp Ser Pro Leu Val Gln Ala Leu Ser Gly Leu His Leu Ser Ala Asp
225
                                        235
                                                             240
                    230
Arg Leu Glu Asp Ser Asn Lys Leu Lys Arg Ser Phe Ser Leu Asp Ile
                                    250
Lys Ser Val Ser Tyr Ser Ala Ser Met Ala Ala Ser Leu His Gly Phe
            260
                                265
                                                     270
Ser Ser Ser Glu Asp Ala Leu Glu Tyr Tyr Lys Pro Ser Thr Thr Leu
```

Asp Gly Thr Asn Lys Leu Cys Gln Phe Ser Pro Val Gln Glu Leu Ser

```
295
                                            300
Glu Gln Thr Pro Glu Thr Ser Pro Asp Lys Glu Glu Ala Ser Ile Pro
                                        315
                   310
Lys Lys Leu Gln Thr Ala Arg Pro Ser Asp Ser Gln Ser Lys Arg Leu
               325
                                    330
His Ser Val Arg Thr Ser Ser Ser Gly Thr Ala Gln Arg Ser Leu Leu
                                345
Ser Pro Leu His Arg Ser Gly Ser Val Glu Asp Asn Tyr His Thr Ser
                            360
Phe Leu Phe Gly Leu Ser Thr Ser Gln Gln His Leu Thr Lys Ser Ala
                        375
Gly Leu Gly Leu Lys Gly Trp His Ser Asp Ile Leu Ala Pro Gln Thr
                                        395
                    390
Ser Thr Pro Ser Leu Thr Ser Ser Trp Tyr Phe Ala Thr Glu Ser Ser
               405
                                   410
His Phe Tyr Ser Ala Ser Ala Ile Tyr Gly Gly Ser Ala Ser Tyr Ser
                                425
                                                    430
Ala Tyr Ser Cys Ser Gln Leu Pro Thr Cys Gly Asp Gln Val Tyr Ser
       435
                            440
                                                445
Val Arg Arg Gln Lys Pro Ser Asp Arg Ala Asp Ser Arg Arg Ser
                       455
Trp His Glu Glu Ser Pro Phe Glu Lys Gln Phe Lys Arg Arg Ser Cys
                    470
                                        475
Gln Met Glu Phe Gly Glu Ser Ile Met Ser Glu Asn Arg Ser Arg Glu
               485
                                    490
Glu Leu Gly Lys Val Gly Ser Gln Ser Ser Phe Ser Gly Ser Met Glu
           500
                                505
Ile Ile Glu Val Ser
        515
<210> 22
<211> 6
<212> PRT
<213> Artificial Sequence
<223> Autophosphorylation site from EGF receptor.
<400> 22
Asp Ala Asp Glu Tyr Leu
```